FLOOD INSURANCE STUDY

CITY OF JACKSBORO, TEXAS
JACK COUNTY

JANUARY 15, 1988

Federal Emergency Management Agency

COMMUNITY NUMBER - 480378

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
CITY OF JACKSBORO, JACK COUNTY, TEXAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the City of Jacksboro, Jack County, Texas, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the Fort Worth District of the U. S. Army Corps of Engineers (COE) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-1822. This work was completed in August 1986.

1.3 Coordination

On March 12, 1985, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the city, and the Fort Worth District of the COE (the study contractor) to determine the streams to be studied by detailed methods. Also discussed were local floodplain regulations, available mapping, flood history, and other hydrologic data. Available data were requested from the City of Jacksboro; the U. S. Geological Survey (USGS); the U. S. Coast and Geodetic Survey (USC&GS); the Soil Conservation Service (SCS); the Texas Department of Highways and Public Transportation; Radv and Associates Engineers; and Henningson, Durham and Richardson Engineering of Austin, Texas. On January 26, 1987, a final CCO meeting was held with representatives of FEMA, the city, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Jacksboro, Jack County, Texas. The area of study is shown on the Vicinity Map (Figure 1).

The following flooding sources were studied by detailed methods within the city:

Stream	Limits of Detailed Study
Stream LCC-1	From a point approximately 500 feet downstream of U. S. Route 281 to a point approximately 100 feet upstream of Archer Street.
Stream LCC-1 Diversion Channel	From its confluence with Stream LCC-1 to a point approximately 620 feet upstream.
Stream LCC-2	From a point approximately 1,280 feet upstream from its confluence with Little Cleveland Creek to a point approximately 0.5 mile upstream.
Lost Creek	From the Lake Jacksboro Spillway to a point approximately 100 feet upstream of the abandoned Chicago, Rock Island & Pacific Railroad.
Lake Jacksboro Spillway Channel	From its confluence with Lost Creek to the Lake Jacksboro Spillway.
Stream LC-1	From its confluence with Lost Creek to a point approximately 60 feet upstream of State Route 148.
Stream LC-2	From its confluence with Lost Creek to a point approximately 0.4 mile upstream.
Stream LC-3	From its confluence with Lost Creek to a point approximately 900 feet upstream of State Park Road.
Rock Quarry Reservoir	For its entire length within the city.
Stream LC-4	From its confluence with Lost Creek to a point approximately 375 feet upstream of South 2nd Street.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through August 1991.

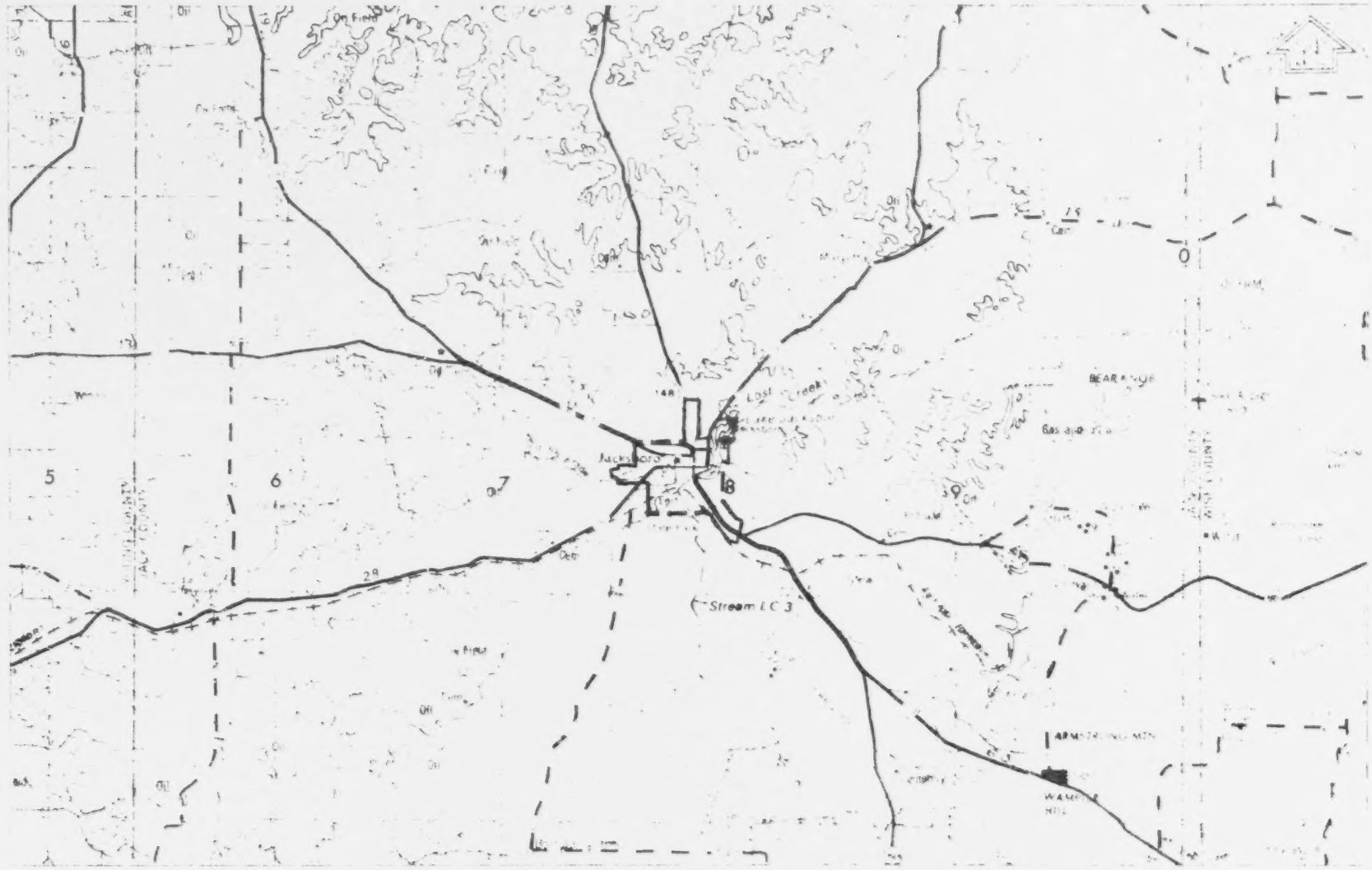


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

An unnamed tributary to Stream LC-2, the remaining portions of Lost Creek, and several unnamed tributaries to Lost Creek were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the City of Jacksboro.

2.2 Community Description

Jacksboro, the county seat of Jack County, is located in the center of the county approximately 60 miles northwest of Fort Worth and 60 miles south-southeast of Wichita Falls. It is completely surrounded by the unincorporated areas of Jack County. The population was 1,311 in 1900, 2,368 in 1940, 2,928 in 1950, 3,816 in 1960, 3,554 in 1970, and 4,000 in 1980 (References 1, 2, and 3). An annual Frontier Fair held each May and a museum maintained at historic Fort Richardson have been developed as tourist attractions in the city (Reference 2). Other communities in Jack County are Antelope (population 65), Bryson (population 579), Jerymn (population 975), Maryetta (population 87), Postoak (population 79), Vineyard (population 37), and Wizard Wells (population 69) (References 1 and 3).

Jacksboro was named for P. C. and W. H. Jack, who were leaders in the independence of Texas. Calvin Gage and Moses Damron started the community in 1855 and called it Lost Creek. The named was changed to Mesquiteville, then to Jacksborough in 1858 when it became the county seat, and then to Jacksboro in 1899. In 1871, industry included flour mills, brickyards, gristmills, sawmills, and a cotton gin. In 1898, a branch of the Chicago and Rock Island Railroad reached the area and was extended to Graham in 1902 (Reference 2).

The community began to thrive with the building of Fort Richardson in 1867. The fort, located on Lost Creek approximately 0.5 mile south of Jacksboro, was originated when six companies of the 6th Cavalry camped in Jacksboro on January 4, 1866. Fort Richardson was named for Israel B. Richardson, who was fatally wounded at the battle of Antietam in 1862. Fort Richardson was ordered to be abandoned on May 23, 1878. For a short time afterwards, the buildings were used for an Indian school. Several of the post buildings were partially reconstructed in 1936 and the grounds used as headquarters for the local unit of the Texas National Guard (Reference 2).

Residential growth of Jacksboro is progressing toward the west and northwest, industrial growth is developing toward the southeast, and commercial growth is developed along U. S. Route 281 from the southeast to the northwest.

2.3 Principal Flood Problems

Generally, the major storms experienced in the vicinity of Jacksboro are produced by heavy rainfall from frontal-type storms that may occur at any time during the year. However, these storms are more prevalent during the spring and summer months. Major flooding can be produced by the intense rainfall usually associated with localized thunderstorms. No flood history information was available for this study.

2.4 Flood Protection Measures

In May 1975, the City of Jacksboro entered into the emergency flood insurance program with FEMA. Floodplain development is regulated by ordinance. No flood protection structures are in existence for the City of Jacksboro. Lake Jacksboro Dam is located on Lost Creek but does not provide flood protection.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. A flood event of a magnitude which is expected to be equaled or exceeded once on the average during any 100-year period (recurrence interval) has been selected as having special significance for floodplain management and for flood insurance rates. This event, commonly termed the 100-year flood, has a 1 percent chance of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

Discharges for the streams studied by detailed methods were developed using the computer program NUDALLAS (Reference 4). The

watershed was divided into sub-basins. Synthetic unit and flood hydrographs were developed at selected locations. Technical Paper No. 40 and Technical Memorandum NWS Hydro-35 were used in developing the 100-year frequency storm (References 5 and 6).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
STREAM LCC-1		
At confluence with Little Cleveland Creek	0.47	1,180
At U. S. Route 281	0.32	790
At Archer Street	0.13	450
STREAM LCC-1 DIVERSION CHANNEL		
At confluence with Stream LCC-1	0.32	790
STREAM LCC-2		
At confluence with Little Cleveland Creek	0.23	580
Approximately 500 feet downstream of Starr Lane	0.07	250
LOST CREEK		
At Lake Jacksboro (total outflow)	25.53	16,800
At Lake Jacksboro (total inflow)	25.53	17,300
Below confluence of Halls Branch	22.32	16,800
Above confluence of Halls Branch	17.59	13,100
Below confluence of Stream LC-2	17.43	13,000
Above confluence of Stream LC-2	16.74	12,900*
Below confluence of Stream LC-3	16.66	13,600

*Reduction in peak discharges is due to the effect of routing built into the unit hydrograph techniques used in the hydrologic analysis

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
LOST CREEK (continued)		
Above confluence of Stream LC-3	14.63	12,000*
At abandoned Chicago, Rock Island, and Pacific Railroad	14.07	12,100
LAKE JACKSBORO SPILLWAY CHANNEL	25.53	16,800
STREAM LC-1		
Approximately 1,700 feet upstream of State Route 59	0.81	1,680
At State Route 148	0.43	1,260
STREAM LC-2		
At confluence with Lost Creek	0.69	1,420
Approximately 2,000 feet upstream of confluence with Lost Creek	0.52	1,230
STREAM LC-3		
At confluence with Lost Creek	2.03	2,330
Approximately 2,600 feet upstream of State Park Road	1.61	2,290
Approximately 9,550 feet upstream of State Park Road	0.53	950
Approximately 11,550 feet upstream of State Park Road	0.34	740
ROCK QUARRY RESERVOIR		
At confluence with Stream LC-3	2.03	1,230

*Reduction in peak discharges is due to the effect of routing built into the unit hydrograph techniques used in the hydrologic analysis

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
STREAM LC-4**		
Below abandoned Gulf, Texas, & Western Railroad	0.39	1,060
Above abandoned Gulf, Texas, & Western Railroad	0.39	1,340

** Discharges represent peak values after and before routing through railroad structure

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections for the backwater analyses were field surveyed and were located at close intervals above and below bridges and culverts in order to compute the significant backwater effects of these structures. Bridge data were obtained by field measurements and by bridge plans from the Texas Department of Highways and Public Transportation.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and Flood Insurance Rate Map (Exhibit 2) where applicable. Along certain portions of Lake Jacksboro Spillway Channel, Stream LC-1, and Rock Quarry Reservoir, a profile base line is shown on the maps to represent channel distances as indicated on the flood profiles and floodway data tables.

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 7). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. The starting water-surface elevation for Lake Jacksboro Spillway Channel was based on the computed water-surface elevation on Lost Creek at the confluence of the spillway. For the remaining streams studied by detailed methods, the starting water-surface elevations were based on slope/area computations.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas. The channel and overbank "n"

values for the streams studied by detailed methods are shown in the following tabulation:

Stream	Channel "n"	Overbank "n"
Stream LCC-1	0.030-0.060	0.060-0.085
Stream LCC-1 Diversion Channel	0.045-0.050	0.060-0.080
Stream LCC-2	0.040-0.060	0.050-0.090
Lost Creek	0.030-0.060	0.040-0.090
Lake Jacksboro Spillway Channel	0.050-0.060	0.065-0.080
Stream LC-1	0.040-0.055	0.060-0.090
Stream LC-2	0.060	0.080
Stream LC-3	0.040-0.060	0.060-0.080
Rock Quarry Reservoir	0.040-0.070	0.060-0.080
Stream LC-4	0.050-0.055	0.070-0.085

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100-year floodplain boundaries to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. For the streams studied in detail, the 100-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (Reference 8).

For the flooding sources studied by approximate methods, the approximate boundaries were delineated using the Flood Hazard Boundary Map for the City of Jacksboro (Reference 9).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

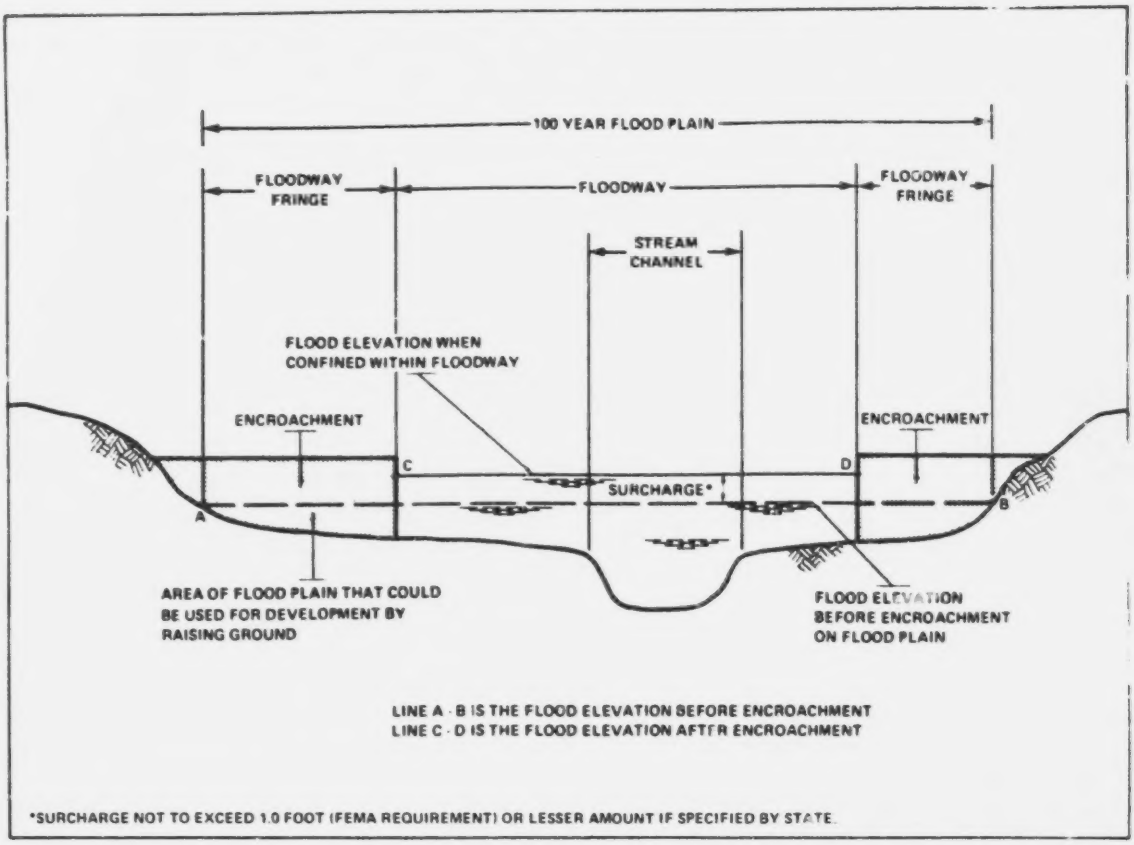
No floodways were calculated as part of this study.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC

Floodway Schematic - Figure 2

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100-year floodplain. The locations of selected cross sections used in the hydraulic analyses are shown where applicable.

7.0 OTHER STUDIES

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the City of Jacksboro (Reference 9).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Federal Regional Center, 800 North Loop 288, Denton, Texas 76201.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Texas, Washington, D. C., U. S. Government Printing Office, 1981.

2. The Handbook of Texas, Texas, Texas State Historical Association, 1952 and 1976.

3. The 1986-1987 Texas Almanac (Sesquicentennial edition), Texas, Dallas Morning News.

4. U. S. Army Corps of Engineers, Fort Worth District, Computer Program NUDALLAS, Fort Worth, Texas, revised September 1982.

5. U. S. Department of Commerce, Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D. C., 1961, Revised 1963.

6. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Technical Memorandum NWS Hydro-35, Five to 60-Minute Precipitation Frequency for the Eastern and Central United States, Asheville, North Carolina, June 1977.

7. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Users Manual, Davis, California, January 1981, with updates.

8. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 Feet: Jacksboro, Texas, 1961, Photorevised 1979.

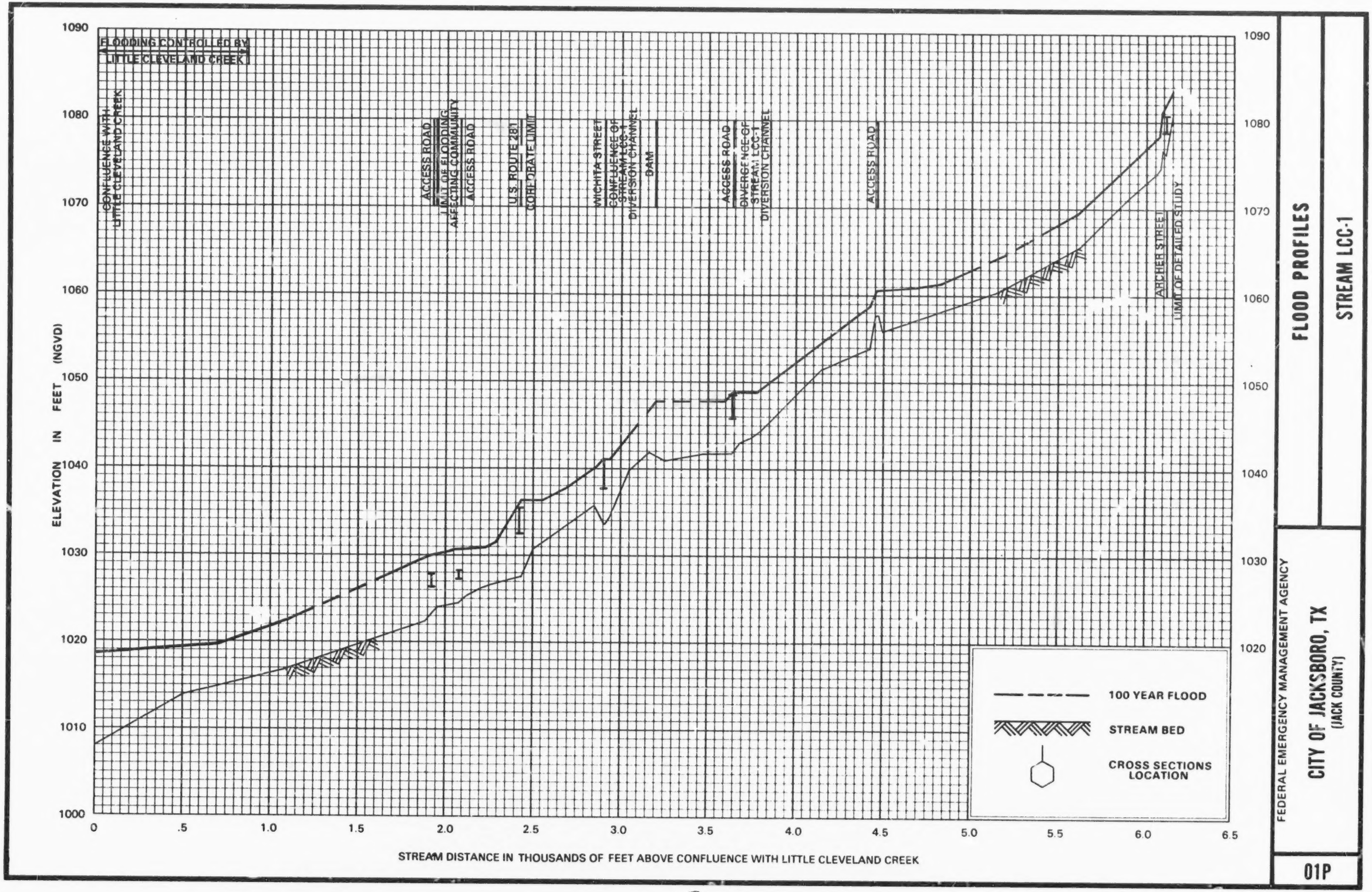
9. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Jacksboro, Jack County, Texas, February 6, 1976.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	Elevation (Feet NGVD)	Description of Location
RM 1	1,068.712	USC&GS brass cap stamped "Q 1168 1961", located approximately 4600 feet west of the intersection of State Route 148 with U. S. Highway 281, 64 feet south of the centerline of U. S. Highway 281, 4.5 feet south of the south fence along the highway, approximately 6 feet above the roadway level, set on top of a large flat rock outcrop projecting about 2 inches above ground.
RM 2	1,052.642	USC&GS brass cap stamped "P 1168 1961", located 55 feet northeast of the centerline of U. S. Highway 281 and 25 feet east of State Route 148, set in the top of the northwest end of a concrete culvert headwall, about 1 foot below highway level.
RM 3	1,059.39	Chiseled "X" onto of south edge of sanitary sewer manhole, located 90 feet west of the intersection of Starr Lane with Lacewell Street, and 18 feet north of Starr Lane.
RM 4	1,083.01	Chiseled "X" on top of curb at the northeast corner of the intersection of 11th Street and West Archer Street.
RM 5	1,083.823	USC&GS Disk stamped "Jacksboro No. 1 1935", located 58.5 feet west of the Northwest corner of Bell Telephone office, 49 feet East of the centerline of South Church street, 47 feet south of the centerline of East Belnap Street, set in the top of a concrete post, projecting 8 inches above ground.
RM 6	1,048.49	Chiseled "X" at the end of a curb turnout into "Kwik-Stop", at the south end of sidewalk along west side of U. S. Highway 281, approximately 420 feet south of centerline of bridge of Lost Creek.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	Elevation (Feet NGVD)	Description of Location
RM 7	1,082.281	USC&GS brass cap stamped "Z 189 1933", located 140 feet north of State Park Road and 39 feet southwest of the centerline of the abandoned Chicago Rock Island & Pacific R.R. grade, in the top of a rock outcrop, flush with the ground.



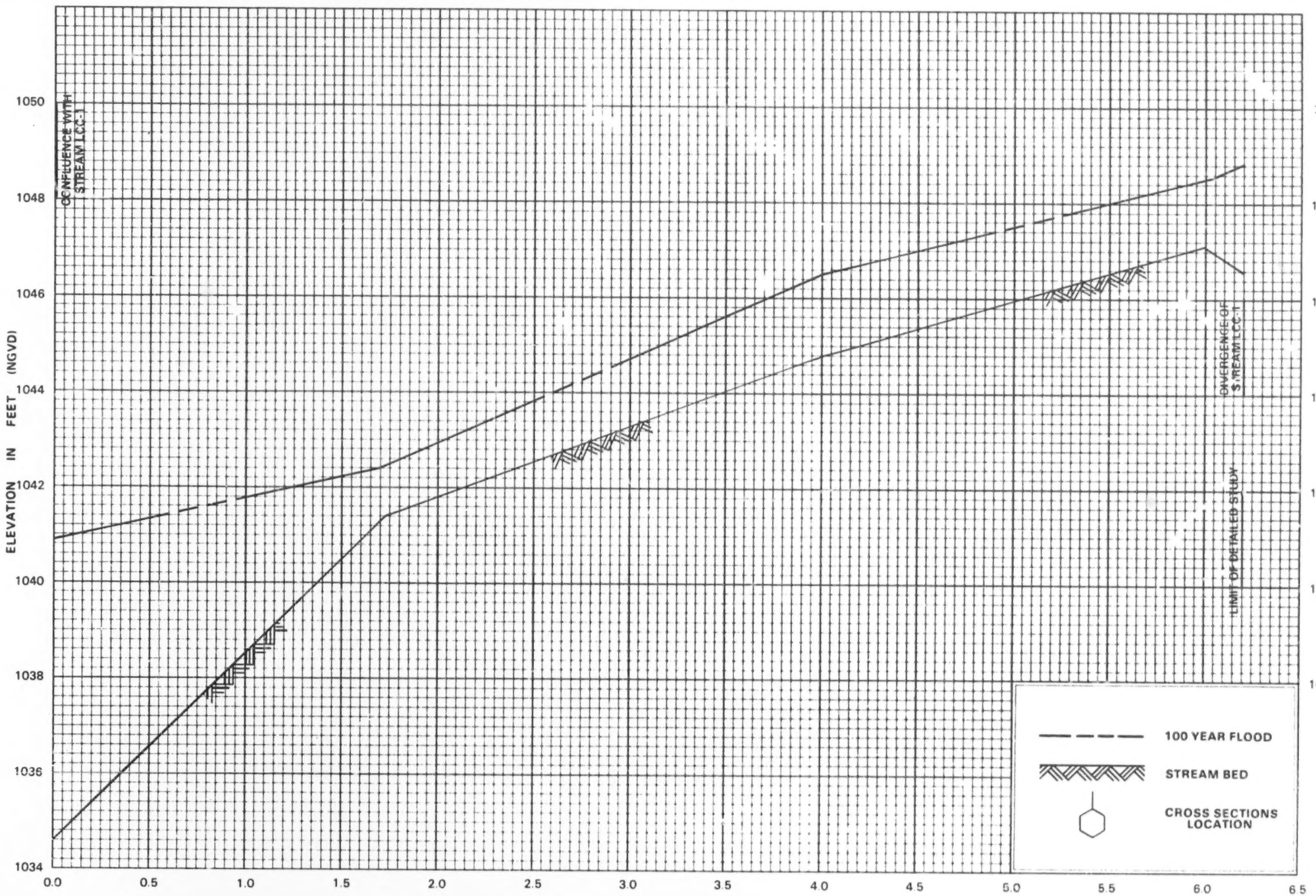
FLOOD PROFILES

STREAM LCC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

01P



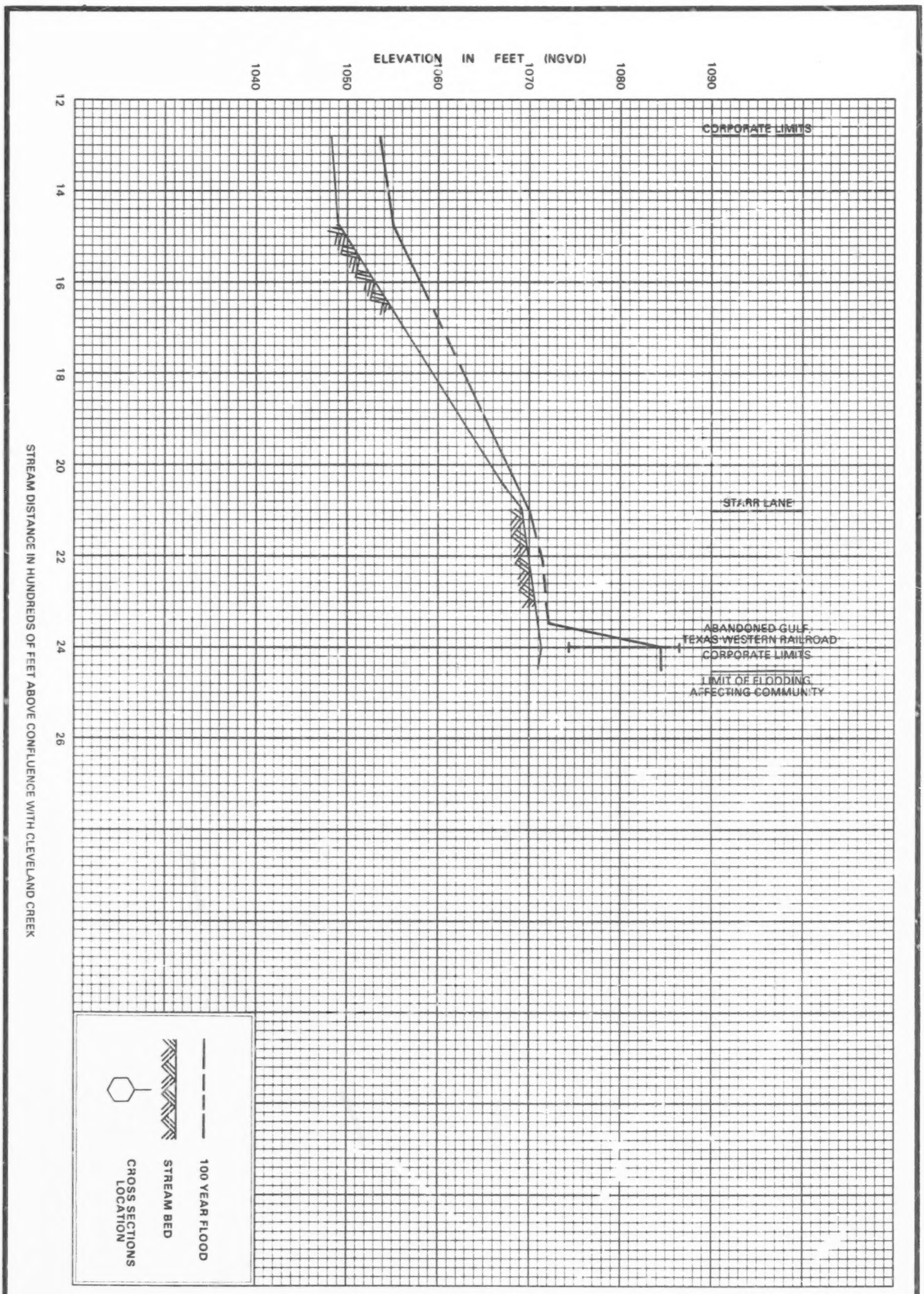
FLOOD PROFILES

STREAM LCC-1 DIVERSION CHANNEL

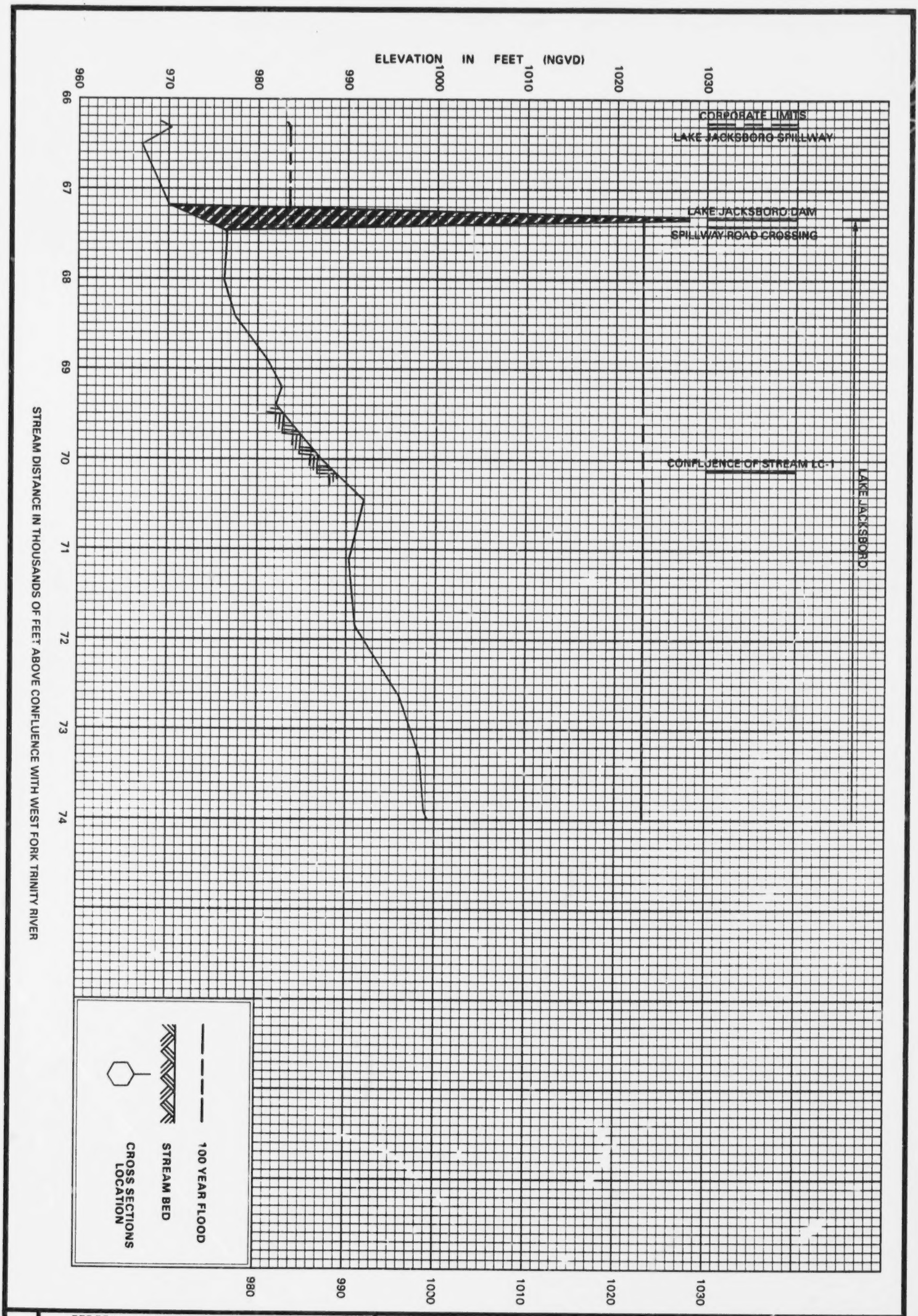
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

02P



03P	FEDERAL EMERGENCY MANAGEMENT AGENCY CITY OF JACKSBORO, TX (JACK COUNTY)	FLOOD PROFILES STREAM LCC-2



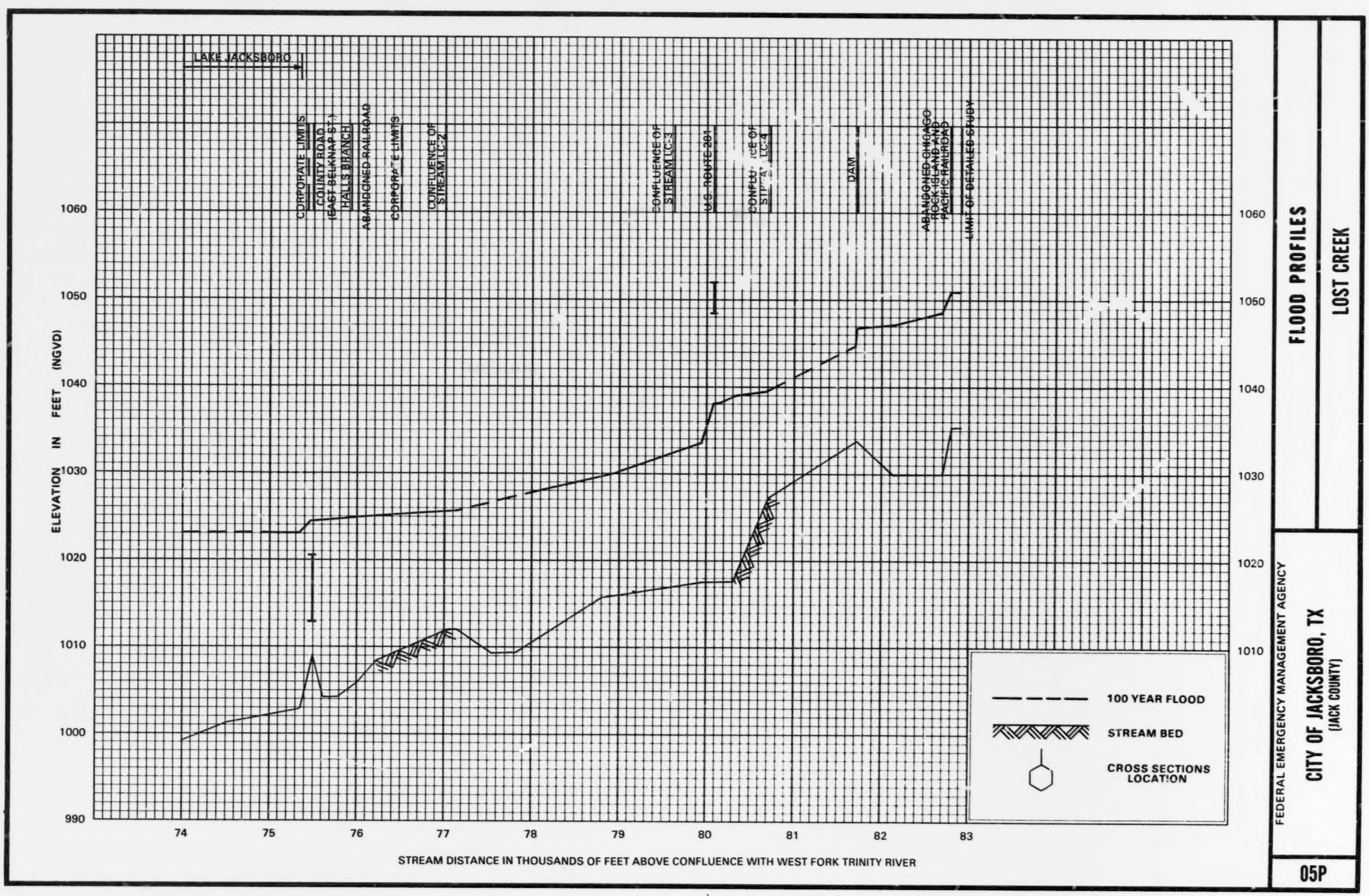
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

04P

FLOOD PROFILES

LOST CREEK



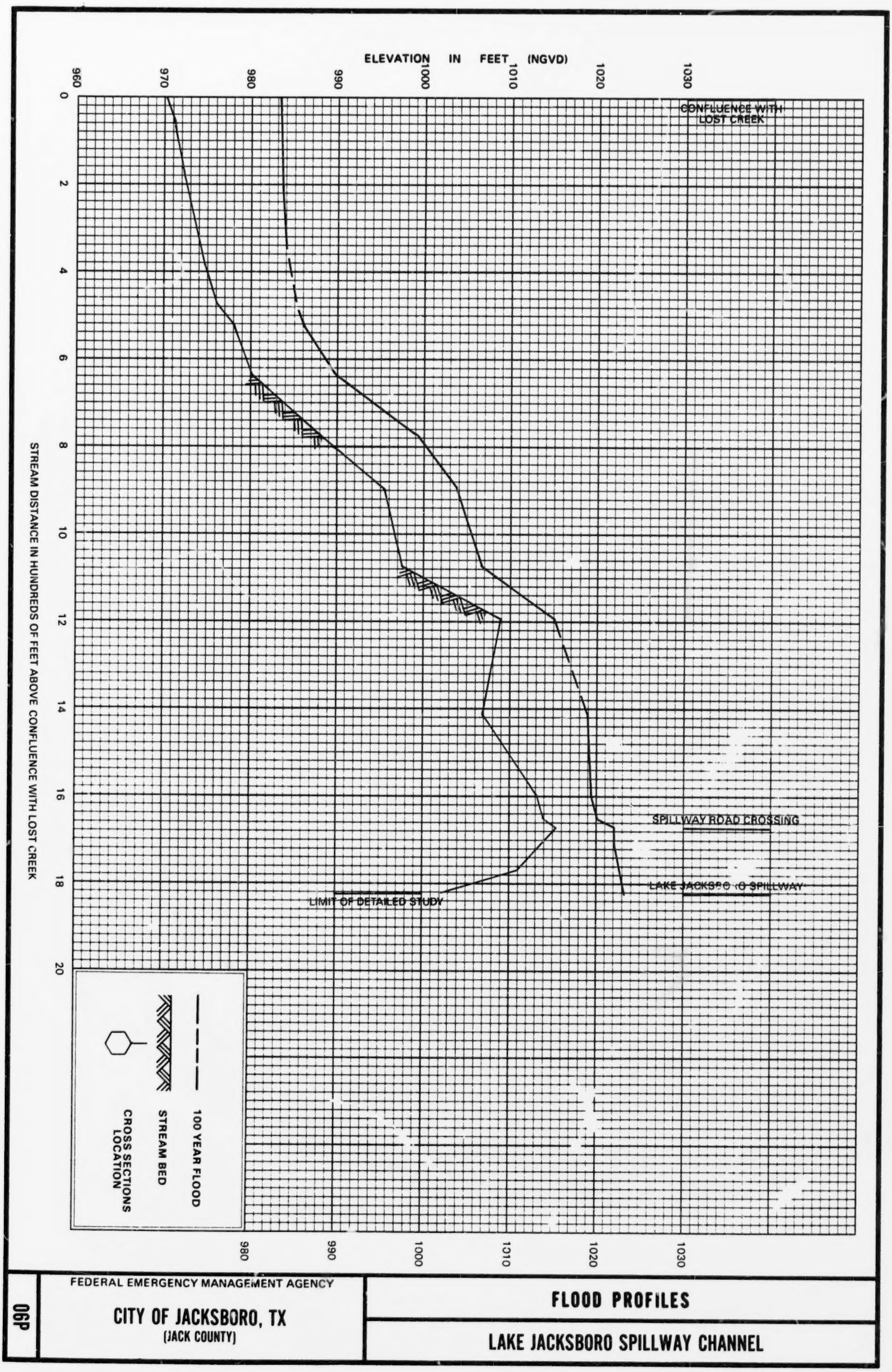
FLOOD PROFILES

LOST CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

05P



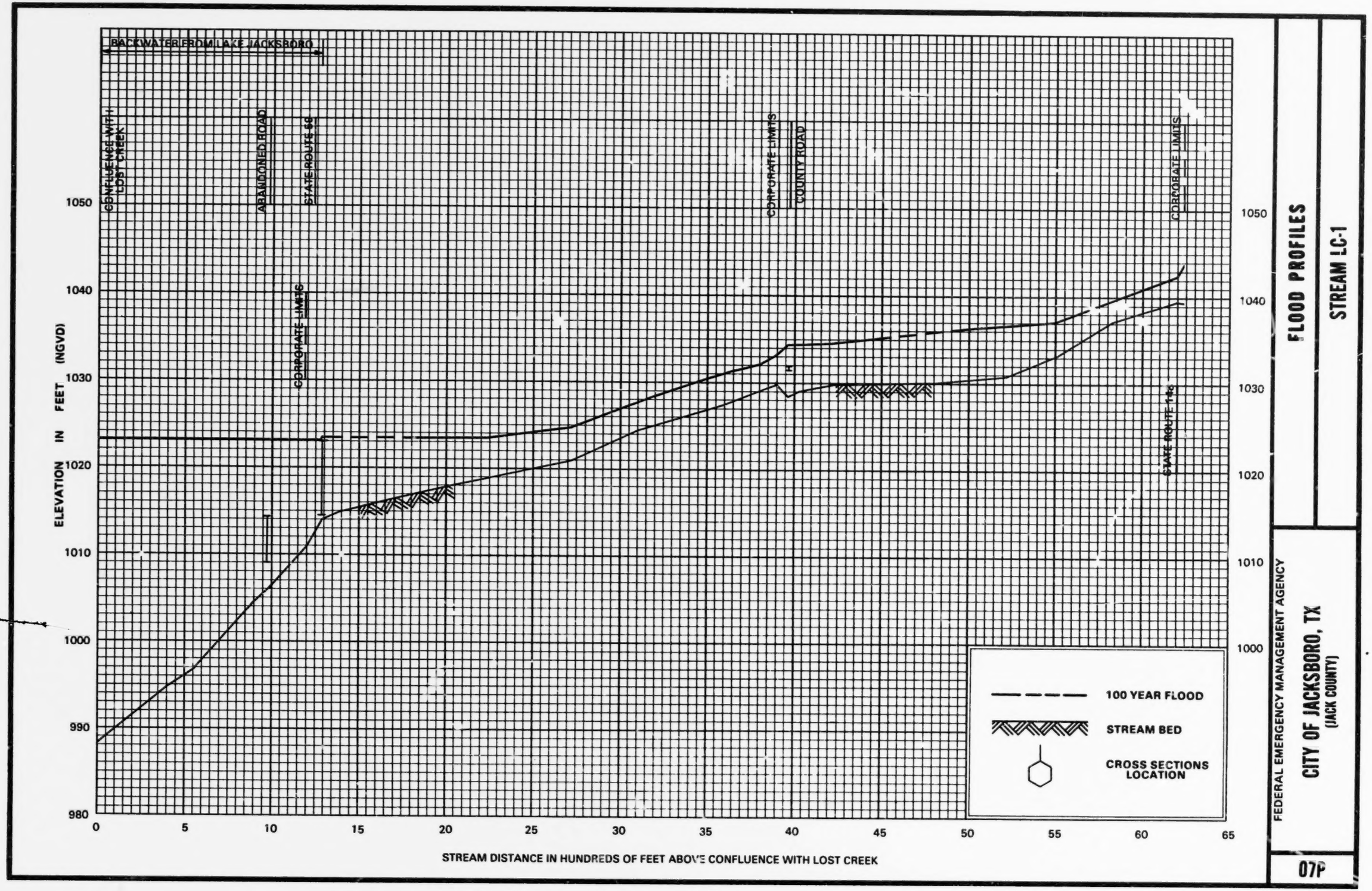
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

FLOOD PROFILES

LAKE JACKSBORO SPILLWAY CHANNEL

06P



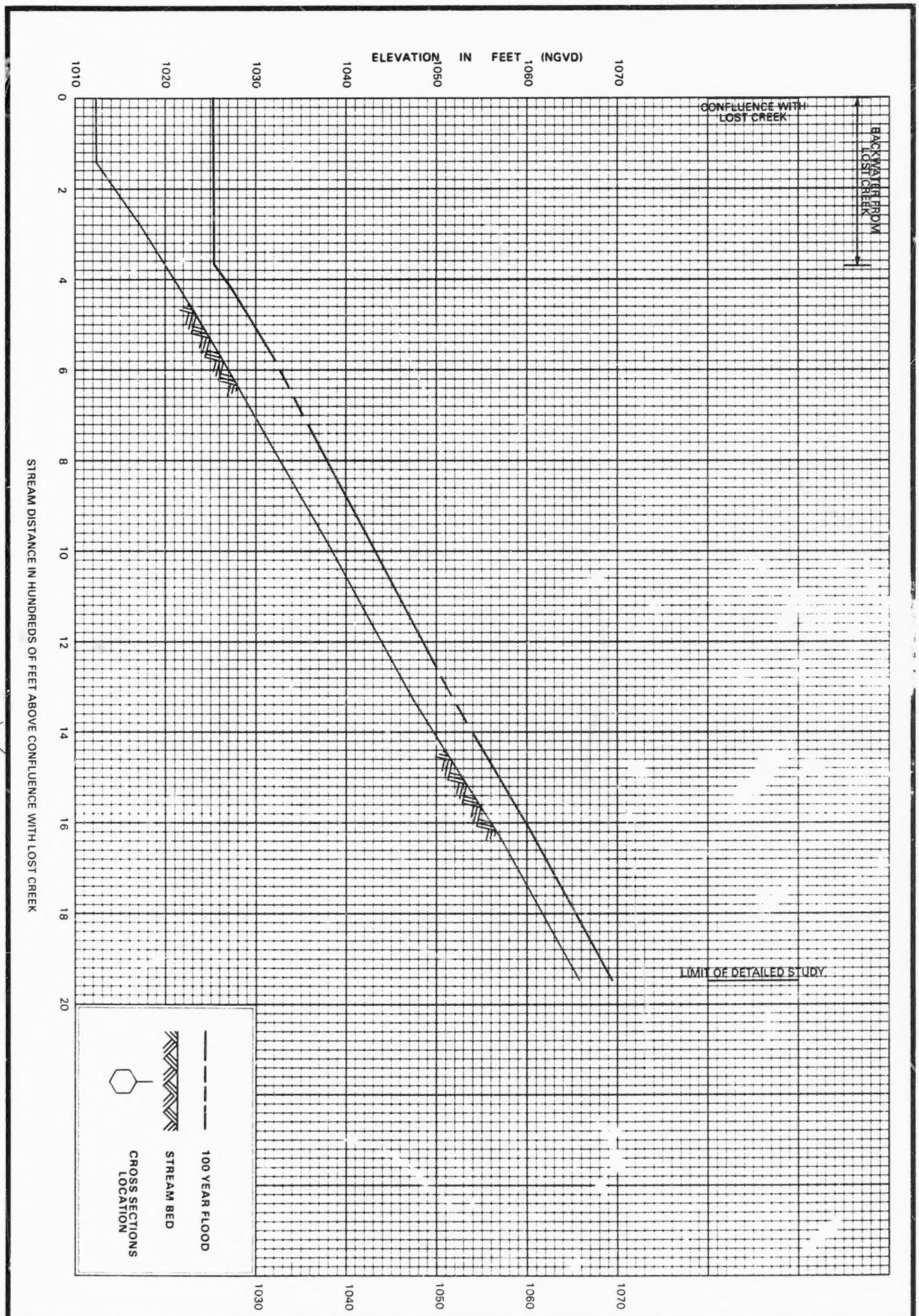
FLOOD PROFILES

STREAM LC-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

07P



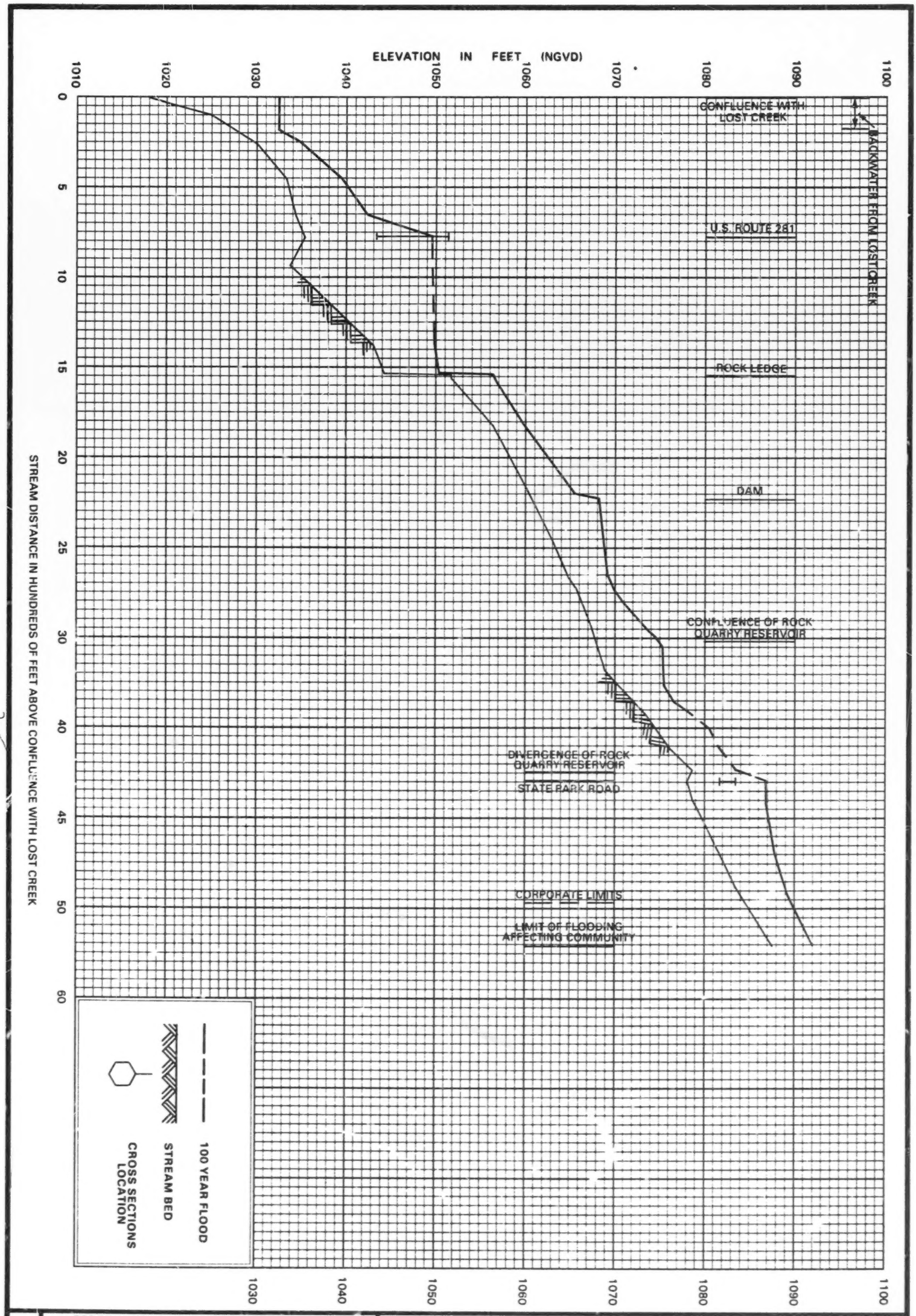
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

FLOOD PROFILES

STREAM LC-2

08P



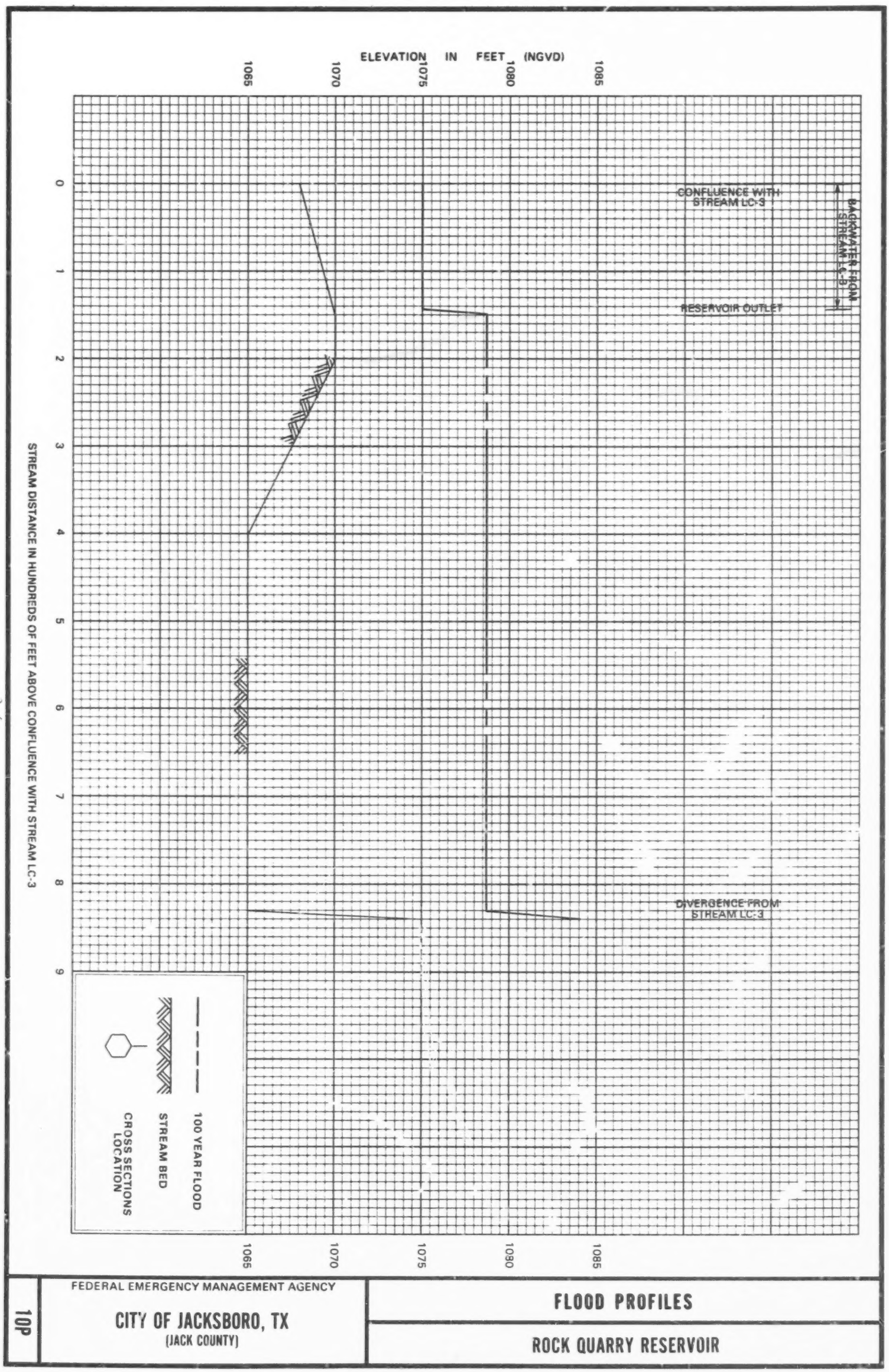
09P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

FLOOD PROFILES

STREAM LC-3



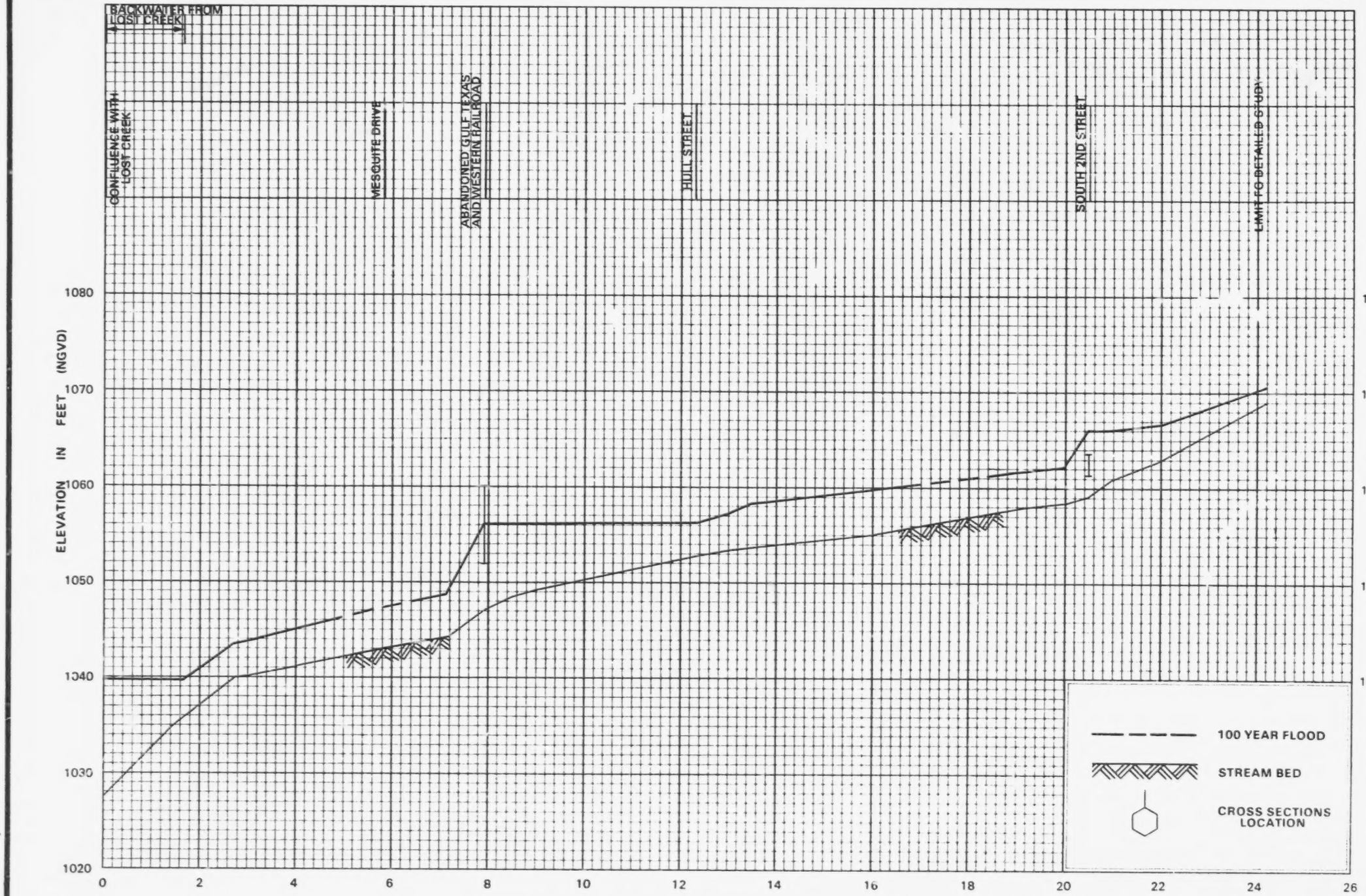
10P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

FLOOD PROFILES

ROCK QUARRY RESERVOIR



FLOOD PROFILES

STREAM LC-4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF JACKSBORO, TX
(JACK COUNTY)

11P